

1. In a code generation computing system that includes one or more processors capable of executing computer-executable instructions in system memory, a method for the code generation computing system to automatically generate code that tests capabilities of a test computing system to use a message exchange pattern application to engage in message transactions following a message exchange pattern, the method comprising the following:

an act of accessing a message exchange pattern definition that defines a plurality of states, the message exchange pattern definition further having for each of the plurality of states, an indication of one or more valid messages that conform to the message exchange pattern for that state, an indication of which computing system may transmit each valid message given the state, and a state transition indication for at least some of the valid messages identifying one of the plurality of states to transition to should the valid message occur;

for each state in which the message exchange pattern definition allows a valid transmission message to be transmitted by the test computing system, an act of generating code that at least simulates transmission of the valid transmission message, and that transitions to other code that represents the state to transition to should the valid transmission message be transmitted; and

for each state in which the message exchange pattern definition allows a valid receipt message to be received, an act of generating code that simulates the receipt of the valid receipt message, and that transitions to other code that represents the state to transition to should the valid receipt message be received.

2. A method in accordance with Claim 1, wherein the message exchange pattern definition indicates that when in a particular state, any one of a plurality of valid transmission messages may be transmitted.

3. A method in accordance with Claim 2, wherein the message exchange pattern definition indicates for each of the plurality of valid transmission messages for the particular state, a percentage chance that each of the plurality of valid transmission messages will be transmitted given the particular state, wherein the method further comprises automatically generating code for at least simulating each of the plurality of valid transmission messages and performing appropriate state transitions given the transmission.

4. A method in accordance with Claim 3, further comprising the following:
an act of generating code that generates a pseudo-random value and selects one of the plurality of valid transmission messages for transmission based on the pseudo-random value and on the percentage chance.

5. A method in accordance with Claim 1, further comprising the following for at least one state:

an act of generating code that at least simulates transmission of an invalid transmission message.

6. A method in accordance with Claim 5, wherein there is also indicated a percentage chance that the invalid transmission messages will be transmitted given the

particular state, wherein the method further comprises an act of generating code that generates a pseudo-random value and selects one of the invalid transmission message for transmission based on the pseudo-random value and on the percentage chance.

7. A method in accordance with Claim 1, wherein the message exchange pattern definition indicates that when in a particular state, any one of a plurality of valid receipt messages may be received.

8. A method in accordance with Claim 7, wherein the message exchange pattern definition indicates for each of the plurality of valid receipt messages for the particular state, a percentage chance that each of the plurality of valid receipt messages will be received given the particular state, wherein the method further comprises automatically generating code for simulating each of the plurality of valid receipt messages and performing appropriate state transitions given the transmission.

9. A method in accordance with Claim 8, further comprising the following:
an act of generating code that generates a pseudo-random value and selects one of the plurality of valid receipt messages for simulated receipt based on the pseudo-random value and on the percentage chance.

10. A method in accordance with Claim 1, further comprising the following for at least one state:

an act of generating code that simulates receipt of an invalid transmission message.

11. A method in accordance with Claim 10, wherein there is also indicated a percentage chance that the invalid receipt message will be received given the particular state, wherein the method further comprises an act of generating code that generates a pseudo-random value and selects one of the invalid received message for simulated receipt based on the pseudo-random value and on the percentage chance.

12. A method in accordance with Claim 1, wherein the message exchange pattern definition is defined using the Web Services Description Language (WSDL) standard.

13. A method in accordance with Claim 1, wherein the message exchange pattern definition further defines timing policies to be imposed when in a particular state.

14. A computer program product for use in a code generation computing system that includes one or more processors capable of executing computer-executable instructions in system memory, the computer program product for performing a method for the code generation computing system to automatically generate code that tests capabilities of a test computing system to use a message exchange pattern application to engage in message transactions following a message exchange pattern, the computer program product comprising one of more computer-readable media that, when executed by one or more processors of the code generation computing system, causes the code generation computing system to perform the method, the method comprising the following:

an act of accessing a message exchange pattern definition that defines a plurality of states, the message exchange pattern definition further having for each of the plurality of states, an indication of one or more valid messages that conform to the message exchange pattern for that state, an indication of which computing system may transmit each valid message given the state, and a state transition indication for at least some of the valid messages identifying one of the plurality of states to transition to should the valid message occur;

for each state in which the message exchange pattern definition allows a valid transmission message to be transmitted by the test computing system, an act of generating code that at least simulates transmission of the valid transmission message, and that transitions to other code that represents the state to transition to should the valid transmission message be transmitted; and

for each state in which the message exchange pattern definition allows a valid receipt message to be received, an act of generating code that simulates the receipt of the valid

receipt message, and that transitions to other code that represents the state to transition to should the valid receipt message be received.

15. A computer program product in accordance with Claim 14, wherein the message exchange pattern definition indicates that when in a particular state, any one of a plurality of valid transmission messages may be transmitted.

16. A computer program product in accordance with Claim 15, wherein the message exchange pattern definition indicates for each of the plurality of valid transmission messages for the particular state, a percentage chance that each of the plurality of valid transmission messages will be transmitted given the particular state, wherein the method further comprises automatically generating code for at least simulating each of the plurality of valid transmission messages and performing appropriate state transitions given the transmission.

17. A computer program product in accordance with Claim 16, further comprising the following:

an act of generating code that generates a pseudo-random value and selects one of the plurality of valid transmission messages for transmission based on the pseudo-random value and on the percentage chance.

18. A computer program product in accordance with Claim 14, further comprising the following for at least one state:

an act of generating code that at least simulates transmission of an invalid transmission message.

19. A computer program product in accordance with Claim 18, wherein there is also indicated a percentage chance that the invalid transmission messages will be transmitted given the particular state, wherein the method further comprises an act of generating code that generates a pseudo-random value and selects one of the invalid transmission message for transmission based on the pseudo-random value and on the percentage chance.

20. A computer program product in accordance with Claim 14, wherein the message exchange pattern definition indicates that when in a particular state, any one of a plurality of valid receipt messages may be received.

21. A computer program product in accordance with Claim 20, wherein the message exchange pattern definition indicates for each of the plurality of valid receipt messages for the particular state, a percentage chance that each of the plurality of valid receipt messages will be received given the particular state, wherein the method further comprises automatically generating code for simulating each of the plurality of valid receipt messages and performing appropriate state transitions given the transmission.

22. A computer program product in accordance with Claim 21, further comprising the following:

an act of generating code that generates a pseudo-random value and selects one of the plurality of valid receipt messages for simulated receipt based on the pseudo-random value and on the percentage chance.

23. A computer program product in accordance with Claim 14, further comprising the following for at least one state:

an act of generating code that simulates receipt of an invalid transmission message.

24. A computer program product in accordance with Claim 23, wherein there is also indicated a percentage chance that the invalid receipt message will be received given the particular state, wherein the method further comprises an act of generating code that generates a pseudo-random value and selects one of the invalid received message for simulated receipt based on the pseudo-random value and on the percentage chance.

25. A computer program product in accordance with Claim 14, wherein the message exchange pattern definition is defined using the Web Services Description Language (WSDL) standard.

26. A computer program product in accordance with Claim 14, wherein the message exchange pattern definition further defines timing policies to be imposed when in a particular state.

27. A computer program product in accordance with Claim 14, wherein the one or more computer-readable media are physical media.

27. A computer program product in accordance with Claim 14, wherein the one or more computer-readable media are physical media.

28. A computer program product in accordance with Claim 27, wherein the one or more computer-readable media includes system memory.

29. A computer program product in accordance with Claim 27, wherein the one or more computer-readable media includes persistent memory.

30. A computer program product in accordance with Claim 29, wherein the persistent memory is a magnetic disk.

31. In a code generation computing system that includes one or more processors capable of executing computer-executable instructions in system memory, a method for the code generation computing system to automatically generate code that tests capabilities of a test computing system to use a message exchange pattern application to engage in message transactions following a message exchange pattern, the method comprising the following:

an act of accessing a message exchange pattern definition that defines a plurality of states, the message exchange pattern definition further having for each of the plurality of states, an indication of one or more valid messages that conform to the message exchange pattern for that state, an indication of which computing system may transmit each valid message given the state, and a state transition indication for at least some of the valid messages identifying one of the plurality of states to transition to should the valid message occur; and

a step for automatically generating message exchange pattern simulation code using the message exchange pattern definition.

32. A method in accordance with Claim 31, wherein the step for automatically generating message exchange pattern simulation code using the message exchange pattern definition comprises the following:

for each state in which the message exchange pattern definition allows a valid transmission message to be transmitted by the test computing system, an act of generating code that at least simulates transmission of the valid transmission message, and that transitions to other code that represents the state to transition to should the valid transmission message be transmitted; and

for each state in which the message exchange pattern definition allows a valid receipt message to be received, an act of generating code that simulates the receipt of the valid receipt message, and that transitions to other code that represents the state to transition to should the valid receipt message be received.